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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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EXAMINER

ART UNIT

PAPER NUMBER

DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/189,098

Applicant(s)

REINBERG, ALAN R.

Examiner

Howard Weiss

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 August 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 and 32-71 ~~is/are~~ pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 and 32-71 ~~is/are~~ rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 18) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other:

Art Unit: 2814

Attorney's Docket Number: 3528US-(97-1099)

Filing Date: 11/9/98

Continuing Data: RCE established 2/21/01

Claimed Foreign Priority Date: none

Applicant(s): Reinberg

Examiner: Howard Weiss

Claim Rejections - 35 USC § 102 / 103

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

- (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Initially, and with respect to Claims 32 to 38, 70 and 71, note that a "product by process" claim is directed to the product *per se*, no matter how actually made. See In re Thorpe et al., 227 USPQ 964 (CAFC, 1985) and the related case law cited therein which make it clear that it is the final product *per se* which must be determined in a "product by process" claim, and not the patentability of the process, and that, as here, an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. As stated in Thorpe,

even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. *In re Brown*, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972); *In re*

Pilkington, 411 F.2d 1345, 1348, 162 USPQ 145, 147 (CCPA 1969); *Buono v. Yankee Maid Dress Corp.*, 77 F.2d 274, 279, 26 USPQ 57, 61 (2d. Cir. 1935).

Note that Applicant has burden of proof in such cases as the above case law makes clear.

4. Claims 1 to 6, 8 to 10, 32 to 38, 68 and 70 are rejected under 35 U.S.C. § 102(e) as being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as obvious over Brown et al.

Brown et al. show all aspects of the instant invention (e.g. Figure 4 and Column 8 Lines 3 to 47) including:

- an intermediate conductive layer **22** made of a refractory metal (nickel and palladium; Column 6 Lines 39 and 40) in electrical contact with and adjacent to a structure **10** of a semiconductor device, said structure located beneath a bond pad-bearing surface **12** of a silicon oxide-containing protective layer **11**
- an electrically conductive contact layer **26** in electrical contact with said intermediate conductive layer
- an electrical and thermal insulator component **14**, **14a**, **34** made of resin and enveloped and sandwiched between said intermediate conductive and electrically conductive contact layers

As to the grounds of rejection under section 103(a), how the contact is made does not affect the final device structure. See MPEP § 2113 which discusses the handling of "product by process" claims and recommends the alternative (§ 102 / § 103) grounds of rejection. Also, Brown et al. state that the opening **16** (Figure 2B could be sized to any shape as desired by one skilled in the art. Therefore, one skill in the art could form the opening so that the intermediate conductive layer abuts the silicon oxide-containing protective layer as claimed (Claims 68 and 70).

The Specification contains no disclosure of either the critical nature of the claimed arrangement or any unexpected results arising therefrom (the Specification only mentions preferred values). Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990). Since the Applicant has not established the criticality of the thicknesses of the intermediate conductive layer and the contact layer and since these thicknesses are in common use in similar devices in the art, it would have been obvious to one of ordinary skill in the art to use these values for the stated layers in the device of Brown et al.

5. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable Brown et al. in view of Whitten et al.

Brown et al. discloses the claimed invention (Paragraph 4) except that the contact layer comprises copper instead of at least one of a refractory metal, a refractory metal nitride and aluminum. Whitten et al. teach (Column 4 Lines 55 to 57) that refractory metals (i.e. titanium-tungsten and molybdenum) are equivalent conductive materials known in the art. Therefore, because these conductors were art-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute refractory metals for copper.

6. Claims 7, 12 to 19, 39 to 54, 56 to 66, 69 and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki (JP 04-045585) in view of Brown et al.

Sasaki shows most aspects of the instant invention (e.g. Figure 1) including a phase change memory element **13** located beneath the surface of an electrode / bond pad **14** bearing, silicon oxide-containing layer **15**. Sasaki does not show a contact for the memory element as claimed including the intermediate conductive layer, the contact

layer and the insulator component enveloped by said layers. Brown et al. teaches (Paragraph 4 above) to use a contact structure as claimed adjacent to the memory element (pad **12** of Brown et al. would be pad **14** of Sasaki) to reduce costs, promote high throughput and shorten cycle times (Column 2 Lines 58 to 60). It would have been obvious to a person of ordinary skill in the art at the time of invention to use the contact structure as taught by Brown et al. in the device of Sasaki to reduce costs, promote high throughput and shorten cycle times.

7. Claims 20, 55 and 67 rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki in view of Brown et al., as applied to Claims 12, 45 and 56 above, and in further view of Whitten et al.

Sasaki in view of Brown et al. disclose the claimed invention (Paragraph 6) except that the contact layer comprises copper instead of at least one of a refractory metal, a refractory metal nitride and aluminum. Whitten et al. teach (Column 4 Lines 55 to 57) that refractory metals (i.e. titanium-tungsten and molybdenum) are equivalent conductive materials known in the art. Therefore, because these conductors were art-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute refractory metals for copper.

Response to Arguments

8. Applicant's arguments filed 8/17/01 have been fully considered but they are not persuasive. The Applicant states that the contact of Brown et al. is not "adjacent to and in electrical communication with a structure located beneath a bond pad-bearing surface of a silicon oxide-containing protective layer" as stated, for example, in Claim 1. However, the claim limitation "adjacent", taken in its broadest sense, means "close to or nearby" (see Webster's II New Riverside University Dictionary, 1994, Houghton Mifflin Company). The intermediate conductive layer **22** of Brown et al. is shown to be in electrical contact with and adjacent to (i.e. near by) a structure **10** of

a semiconductor device, said structure located beneath a bond pad-bearing surface **12** of a silicon oxide-containing protective layer **11**. Additionally, Brown et al. state the connection can be located anywhere in an integrated circuit formed in or on the surface of the substrate **10** (Column 4 Lines 63 to 67). Therefore, the structure (i.e. integrated circuit) can be located adjacent to the contact structure and is within the scope of the invention as claimed.

In reference to the claim language pertaining to melting temperature of the conducting materials, the claiming of a new use, new function, or unknown property which is *inherently* present in the prior art does not necessarily make the claim patentable. (*In re Best*, 195 USPQ 430, 433 (CCPA 1977) and *In re Swinehart*, 439 F. 2d 210, 169 USPQ 226 (CCPA 1971); please see MPEP § 2112). Since Brown et al. show all the features of the claimed invention including the conductive layers made of the claimed materials, the melting temperature limitation as claimed is an inherent property of Brown et al.'s invention.

The Applicant states that the copper conductive portions of the contact of Brown et al. could not be used since it is well known in the art that copper reacts with silicon-containing materials to cause the copper to blister or delaminate from adjacent silicon structures. However, Brown et al. specifically teach to use copper (Column 8 Lines 3 to 36) and, since all U.S. Patents are considered enabling, the use of copper is assumed to be proper. Similar arguments can be made for Whitten et al. who teach the equivalent of refractory metals and copper.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir.

1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, one of ordinary skill in the art would be motivated to look at Whitten et al. in the device of Brown et al. since the contact structures are essentially the same and analogous art. In the case of Brown et al. and Sasaki, one of ordinary skill in the art would combine the contact structure of Brown et al. in the device for Sasaki to get the benefits as stated by Brown et al. (to reduce costs, promote high throughput and shorten cycle times). In view of these reasons and those set forth in the present office action, the rejections of the stated claims stand.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

10. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. Papers should be faxed to Art Unit 2814 via the Art Unit 2814 Fax Center located in Crystal Plaza 4, room 3C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(703) 308-7722** or **-7724**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications.

Art Unit: 2814

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Howard Weiss** at **(703) 308-4840** and between the hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via **Howard.Weiss@uspto.gov**.


Any inquiry of a general nature or relating to the status of this application should be directed to the **Group 2800 Receptionist** at **(703) 308-0956**.

12. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/ 530; 438/ 600, 601	thru 10/22/01
Other Documentation: none	
Electronic Database(s): EAST (USPAT, JPAB, EPAB, Derwent, ITDB)	thru 10/22/01

Howard Weiss
Patent Examiner
Art Unit 2814

HW/hw
22 October 2001


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